

MEETING MINUTES
LIGNITE RESEARCH COUNCIL
December 4, 1997
Doublewood Inn, Bismarck, ND

MEMBERS (or their authorized alternates) PRESENT:

Dick Bergstad	International Brotherhood of Electrical Workers (IBEW)
Curt Blohm	Knife River Corporation
John Bluemle	North Dakota Geological Survey
Nathan Domyahn	United Power Association
Richard Fockler	Basin Electric Power Cooperative
Mick Grosz	North Dakota State Legislature
Bruce Hagen	North Dakota Public Service Commission
Kent Janssen	Dakota Gasification Company
Marlowe Johnson	Otter Tail Power Company
Michael Jones	Energy and Environmental Research Center
Douglas C. Kane	MDU Resources Group Inc.
August Keller	The North American Coal Corporation
Bruce J. Kopp	Northern States Power
Russ Nelson	Cooperative Power Association
Chuck Reichert	BNI Coal, Ltd./Minnkota Power
Jeff Reinke	Dakota Resource Council
Martin Schock	North Dakota Department of Health
David Sogard	Minnkota Power Cooperative
Valdon Swanson	North Dakota Farm Bureau

OTHERS PRESENT:

Lyndon Anderson	Lignite Energy Council
Gary Arman	Arman Engineering Testing
Lynn Bergman	The Falkirk Mining Company
Dean Bray	Dakota Gasification Company
Al Christianson	Cooperative Power Association
Jim Deutsch	North Dakota Public Service Commission
Karlene Fine	Industrial Commission of North Dakota
Vicki Gilmore	Lignite Energy Council
Richard Gunderson	Houston Engineering Inc.
Alan Hurlbut	BNI Coal, Ltd.
Bill Lengenfelder	Modern Industrial Inc.
Curt Melland	Basin Electric Power Cooperative
William Peterson	BNI Coal, Ltd.
Clifford R. Porter	Lignite Research Council
D. F. Schmidt	retired from The North American Coal Corporation
Bonnie Staiger	Coal Conversion Counties
Andrew Stewart	Cooperative Power Association
Dan Swetich	The Falkirk Mining Company

August Keller called the LRC meeting to order on December 4, 1997, at Doublewood Inn, Bismarck, North Dakota.

A motion to approve Keller as temporary chairman of the December 4, 1997 LRC meeting was made by David Sogard and seconded by Douglas Kane. The motion passed unanimously.

Financial Summary

Clifford R. Porter presented the financial summary for the 1997-1999 North Dakota Lignite Research, Development and Marketing Program. The total program budget for the 1997-1999 biennium is \$14,011,645, which breaks down as follows: \$400,000 for administration of the program, \$400,000 for market feasibility studies, \$1,717,719 for small research projects and \$11,493,926 for demonstration projects.

Approval of Minutes

Keller asked for a motion for approval of the minutes of the July 24, 1997 LRC meeting. Bruce Hagen so moved; seconded by Curt Blohm. Motion carried.

Lignite Research, Development and Marketing Program Updates

Porter said there are two active lignite marketing feasibility studies funded with 1995-1997 project funds: contract LMFS-96-24 with Simmons Advertising for \$10,000 for preparing a mercury facts brochure, and LMFS-96-25 with Chemical Market Resources for \$30,000, concerning intermediates and derivatives from phenol. Porter said two handouts were available for LRC members to pick up as they left the meeting. One is the mercury facts brochure, titled "Mercury and the Environment". The other is an article by Dr. Thomas W. Clarkson, titled "Methylmercury: Loaves versus Fishes".

Porter said the LRC Executive Committee has identified priority areas and target funding of \$400,000 as follows for market areas for the 1997-1999 biennium: market assessment: \$100,000; Regional Lignite Energy Marketing Plan implementation: \$75,000; byproduct marketing studies: \$100,000; environmental studies: \$100,000; and contingency: \$25,000.

In the small research projects area, Porter said that \$4,542,726 has been committed to 71 small research projects since the Lignite Research, Development and Marketing Program was initiated in 1987. Each dollar of Lignite Research Fund program funding has generated \$4.6 of total funding. As of November 1, 1997 there is \$1,979,936 committed to 17 projects whose total funding is \$7,945,655. For these current projects, each dollar of LRF program funding is generating \$4 of total project funding.

Since the program began in 1987, there have been 7 proposed demonstration projects approved for funding. Three projects were withdrawn, funding was provided to assist in the submission of two clean coal applications to the Department of Energy, one project is completed and one project is scheduled for 1998 and 1999. Lignite Research Fund funding of \$12,300,000 (\$4,200,000 investment and \$8,100,000 grant) was approved for the "Production of Anhydrous Ammonia from North Dakota Lignite" project that resulted in the construction of the anhydrous ammonia from lignite plant at the Great Plains Gasification Plant. There is obligated funding of \$6,000,000 (\$4,000,000 investment and \$2,000,000 grant) for Dakota Gasification Company's carbon dioxide pipeline project to transport carbon dioxide from the Great Plains Synfuels Plant for enhanced oil recovery. The project is scheduled for completion in 1999. The 1997-1999 biennium available demonstration project funds total \$3,193,334. Funding requests for demonstration projects in Grant Round XXIX total \$2,847,515.

Project Updates

Curt Melland gave an update on the North Dakota Cyclone Users Group and NO_x control. The Cyclone Users Group has received three grants from the Lignite Research, Development and Marketing Program to assist in NO_x control studies to help lignite-fired cyclone boiler operators find cost-effective ways to reduce NO_x emissions. He said that the EPA's NO_x reduction regulations are being met and additional reductions are possible. Keller asked Melland to explain what the net effect of this research means to those who run the boilers. Melland says it means Basin Electric Power Cooperative will be able to continue operating under EPA's current NO_x regulations at Leland Olds Station Unit #2 until the EPA promulgates new regulations. He said money was not saved as a result of the three projects, but approximately \$35,000,000 did not have to be spent for emissions reduction measures. Melland thanked the LRC for supporting the three projects.

Reichert introduced William Peterson and Al Hurlbut, both of BNI Coal, Ltd., who discussed the background and current status of the Coal Quality Management System project. BNI Coal, Ltd., Minnkota Power Cooperative and Microbeam Technologies, Inc., received two grants from the Lignite Research, Development and Marketing Program for coal quality studies that would lead to identifying reducing coal quality factors that adversely impact boiler operation. Coal quality factors adversely impacting cyclone slagging, excessive oil burning, and cyclone performance were studied. A system was developed to track coal from mine to cyclone boiler. The goal of the project is to increase power plant efficiency. Hurlbut, a member of the coal quality task force, said future goals include validation of the Coal Quality Management System, evaluation of potential solutions to problem areas, and performance optimization.

Kent Janssen gave an update on Dakota Gasification Company's carbon dioxide pipeline project. From Grant Round XXVIII, DGC received funding from the Lignite Research, Development and Marketing Program to help with construction costs for a carbon dioxide for enhanced oil pipeline. Carbon dioxide will be captured at DGC's Great Plains Synfuels Plant, then transported to Canada.

Funding Priorities for 1997-1999 Biennium

Porter, as technical advisor to the LRC, recommended the following estimated target funding priorities for the 1997-1999 research program activities (small projects) be adopted by the LRC: environmental issues: 30% (\$258,490); mining and reclamation: 25% (\$215,408); combustion: 20% (\$172,327); byproducts: 15% (\$129,245); beneficiation: 10% (\$86,163). Reichert said that as in past years, he is asking that targeted funding be increased to higher than 10% for beneficiation so that more projects might result. Kane asked Porter if anything would hinder the LRC from switching money from one area to another if a good project were proposed for an area that had lesser funds. Porter said there is nothing that limits this. The funding guidelines are only suggested targeted amounts with room for adjustment. Kane asked if communications to solicit proposals for projects could emphasize that the numbers are targets and not necessarily binding numbers. Porter said that is being done and will continue to be emphasized. Richard Fockler made a motion that the recommended target funding priorities for the 1997-1999 biennium be approved; seconded by Kane. Motion carried.

Grant Round XXIX Grant Applications

Porter said he categorized all three of the Grant Round XXIX proposals as demonstration projects. There is approximately \$3,000,000 in available lignite research funds for demonstration projects; the three Grant Round XXIX requests amount to approximately \$2.8 million.

Porter summarized technical peer reviewers' comments and gave his technical advisor recommendations for the three Grant Round XXIX project applications, as follows:

LRC-XXIX-A (Amended – Rev. 1): “Construction of a Forced Oxidation Plant for Gypsum Production” ; Submitted by Cooperative Power Association; Principal Investigator: Andrew Stewart; Funding Request for \$1,852,900; Total Project Cost: \$3,705,800; Project Duration: 9 months. (Demonstration Project Request)

Porter said the objective of this project is to construct a forced oxidation conversion facility to produce high quality gypsum from the Coal Creek Station scrubber sludge. It is the third project submitted that is directed at the use of Coal Creek Station scrubber sludge. The first, LRC-XX-63, evaluated technologies and quality, and the second, FY98-XXVIII-77, evaluates markets. The technical peer reviewers gave the project an average weighted score of 164 out of a possible 250 points. One reviewer recommended funding to be considered, one recommended do not fund, and one recommended fund. Porter recommended the project be funded contingent on : an amount not to exceed \$926,500, and at a level not to exceed (not more than 25% LRF funds) \$1 LRF to \$4 total project cost; completion of a marketing study (FY98-XXVIII-77); and submission of a firm matching commitment letter. Sogard asked if Porter would still recommend the project be funded if the marketing study FY98-XXVIII-77 showed there was little market for the gypsum. Reichert asked if the word “positive” could be added before the word “marketing” in the contingency, so that it would read:

completion of a positive marketing study (FY98-XXVIII-77) . Porter said he would do so. He said conflict-of-interest parties are Cooperative Power Association, United Power Association and the Energy and Environmental Research Center.

Reichert asked for a clarification concerning conflict-of-interest companies and if their LRC members may vote for the proposals. Porter said they may do so. Curt Blohm asked why Porter had recommended a matching funding ratio of 4 to 1 instead of 12 to 1, which is the existing demonstration projects ratio. Porter said the other demonstration projects are larger and all three Grant Round XXIX proposals are being recommended at a 4 to 1 funding ratio.

Andrew Stewart, principal investigator, spoke in support of the proposal and described the drying process and equipment that will be used in the gypsum production. He said the main target area for use of the gypsum is agricultural soil amendment for acidic soil. Much of the gypsum used now in North Dakota soil is imported from Iowa, Stewart said.

Reichert asked if the technology proposed in the project would be applicable to other North Dakota power plants, especially cyclone units. Stewart said he did not know of anyone else in North Dakota who is producing calcium sulfite right now, except possibly United Power Association in their scrubber. Reichert asked if anyone would be funding the non-Lignite Research Fund portion of the required funding, and Stewart said that Cooperative Power would do so.

Reichert made a motion that the word "positive" be added in Porter's funding recommendation contingency for this proposal so that the marketing study needs to be positive for the LRC to proceed. The contingency would then read: Completion of the positive marketing study (FY98-XXVIII-77). Kane seconded the motion; motion carried. Blohm made a motion that the LRC follow Porter's recommended ratio for funding of the project. Fine said the ballot already contains Porter's funding recommendations and the contingencies; therefore, a motion is not needed. Blohm withdrew his motion.

Reichert asked if anyone would be funding the required non-matching funding. Stewart said Cooperative Power would do so.

LRC-XXIX-B: "D. F. Schmidt's Rear-Dumping Dragline Bucket"; Submitted by Dakota Coal Company; Principal Investigator: Dean Bray; Funding Request for \$400,000; Total Project Cost: \$1,000,000; Project Duration: One year. (Demonstration Project)

Porter said the project's objective is to demonstrate the 60-80 cubic yard class rear-dumping dragline bucket. The project will provide technical information to demonstrate the commercial viability of the rear-dumping bucket. Testing will be done on BNI's Page 736 dragline. The three technical peer reviewers gave the project an average weighted score of 137.7 out of 250 points. One reviewer recommended fund, one recommended do not fund and one recommended funding to be considered. As technical advisor, Porter's recommendation is to fund, contingent on: an amount not to exceed \$250,000, and at a level not to exceed (not more than 25% LRF funds) \$1 LRF to \$4 total project cost; submission of a set of specific criteria to evaluate bucket performance; and discussion of operation and maintenance costs as a part of the study. Conflict-of-interest parties are Dakota Gasification Company, Basin Electric Power Cooperative and BNI Coal, Ltd.

Dean Bray, principal investigator, said the project is at stage 1 now. The request for funding is for stage 2. If stage 1 is not successful, then Dakota Coal Company would not proceed to stage 2. Reichert said BNI Coal, Ltd. is optimistic the design will work. His one concern is that when the bucket is manufactured, it will also help out-of-state companies cut the cost of producing coal. North Dakota's competitors in Wyoming and Montana will have an advantage if they buy the bucket. He would prefer that North Dakota's competitors pay more for the bucket. Janssen and Keller said that the percentage of Wyoming and Montana companies' costs associated with draglines is quite small.

Reichert asked if the required non-matching funding would be provided. Bray said it would be funded.

LRC-XXIX-C: “Riverdale Haulroad Grade Separation Lignite Ash Demonstration Project”; Submitted by The Falkirk Mining Company; Principal Investigator: Lynn A. Bergman; Funding Request for \$594,615; Total Project Cost: \$1,189,230; Project Duration: One year. (Demonstration Project)

Porter said the objective of the project is construction of a grade separation structure for the Riverdale haulroad using lignite combustion ash. Lignite combustion by-product will be used for structural fill and concrete. The three technical peer reviewers gave the project an average weighted score of 139 out of 250 points. One reviewer recommended fund, one recommended funding to be considered, and one recommended do not fund. As technical advisor, Porter recommended the project be funded, contingent on: an amount not to exceed \$298,000, and at a level not to exceed (not more than 25% LRF funds) \$1 LRF to \$4 total project cost; information on the design criteria of CCB use; and an estimate of the market for lignite-derived combustion by-product ash. Conflict-of-interest parties are The North American Coal Corporation, Cooperative Power Association, United Power Association and Energy and Environmental Research Center.

Stewart was asked by Blohm what the role of McLean County is in the proposed grade separation, which is on the county’s road system. The grade separation will be included in the state of North Dakota’s bridge inventory and thus receive the same inspections as other state bridges do. This project plans to demonstrate that CCBs can be used satisfactorily as a replacement for Portland cement at rates between 30% and 70%. Currently, the acceptable replacement of fly ash for Portland cement is 15% to 20%. A benefit to Falkirk Mine will be a shortening of the haulroad. Lynn Bergman, principal investigator for LRC-XXIX-C, said that after construction the structure will be monitored twice a year for five years. A result of fly ash use would be reduction of importation of Portland cement from other states, creation of a market for exporting the product, and the addition of higher quality jobs. Sogard asked how the project would add jobs for North Dakotans. Bergman said increased use of the fly ash would involve hauling it to more sites, thus requiring more drivers, handlers, etc.

Reichert asked if a marketing study for the use of fly ash had been done. Bergman asked Stewart to reply. Marketing forecasts are done annually, Stewart said. The forecasts show the potential market is phenomenal. Keller said that current guidelines of the North Dakota Department of Transportation indicate between 5% and 10% fly ash, with Portland cement as the remainder. If this project were successful and those levels were raised to 35% or 50% fly ash, a great potential for fly ash would ensue.

Gary Arman commented that higher strength concrete results from the addition of fly ash.

Reichert asked if Porter’s recommendation for funding is followed, would Falkirk Mining be prepared to provide the balance of the funding. Bergman said Falkirk would do so.

Reichert said that from his viewpoint the competitive aspect of the proposal is a concern because he operates a coal company in competition with Falkirk. He asked what the crossing would cost if fly ash were not used. Bergman replied that approximately another \$200,000 would have to be spent. Reichert said there is a cost benefit to Falkirk to build it with fly ash, with the state providing these funds for the project. In addressing Reichert’s statement, Keller said that the LRC has not worried too much about individual companies getting advantages as a result of funded projects. Keller said there are advantages that accrue to those who do the research, and that is important. It is also important that if this particular project can raise the levels of fly ash acceptable to the Department of Transportation from the current 5% or 10% that can be specked in highway projects to 35% or 40%, that would be a great benefit to the state. Reichert said that Keller’s point was a good one, but this is not the first time a similar discussion has occurred at a meeting of the LRC. Reichert said The North American Coal Corporation put restrictions on BNI’s request for a demonstration project four years ago.

Sogard expressed concern about the low ratings the Grant Round XXIX proposals received from the technical peer reviewers. Porter noted that the purpose of the reviewers is not just to review the projects. They also identify areas where projects can be improved, and they did so with the Grant Round XXIX proposals. Reviewers are selected by Porter from a cross-section of individuals from the academic, industry and consultant areas.

1998 Calendar: Grant Application Dates; LRC Meeting Dates

Porter read the following 1998 dates of importance to the LRC:

January 1: Grant Round XXX grant application deadline; February 18: LRC meeting; May 1: Grant Round XXXI grant application deadline; July 22: LRC meeting; September 1: Grant Round XXXII grant application deadline; November 5: LRC meeting. Keller asked for a motion to recommend this calendar to the Industrial Commission. Reichert so moved; seconded by Sogard. Motion carried.

Confidential Balloting for Grant Round XXIX Proposals

Fine said that because the motion was approved earlier in the LRC meeting, each LRC member could write in the word “positive” prior to the words “marketing study” on the ballot under LRC-XXIX-A (Amended – Rev. 1). The statement on the ballot thus reads: LRF Funding to be provided: \$926,500 only upon completion of FY98-XXVIII-77 positive marketing study and submission of firm matching commitment letter.

The LRC cast confidential ballots to either recommend or deny funding of the Grant Round XXIX proposals. Balloting results will be presented to the Industrial Commission for consideration when it reviews these proposals on December 12, 1997. The LRC votes were as follows:

LRC-XXIX-A (Amended – Rev. 1) - 17 Fund; 1 Do Not Fund; 1 Abstained from voting

LRC-XXIX-B - 12 Fund; 6 Do Not Fund; 1 Abstained from voting

LRC-XXIX-C - 12 Fund; 7 Do Not Fund

Adjournment

There being no further business, Keller asked for a motion to adjourn the meeting. Reichert so moved; Blohm seconded. Motion carried.

Vicki Gilmore, Recording Secretary